TREATMENT OF CONGENITAL DISLOCATION OF THE HIP.

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THE methods for treatment of congenital dislocation of the hip are—

(1) By apparatus; (2) By forcible reduction without traction; (3) By operative reduction.

The treatment by apparatus, consisting of the application of corsets pressing upon the trochanters to check the increase of the sinking of the pelvis between the hips and the lordosis, is certainly palliative rather than curative. The same may be said of treatment by traction appliances and ischiatic supports.

The treatment by traction recommended by Guérin, Pravaz, and more recently in a much more complete form by Buckminster Brown, cannot be regarded as reliable or generally practicable.

The methods of treatment by operation which have been suggested are numerous; that of reduction after subcutaneous tenotomy of the muscles would, in view of what is shown by dissection and pathological specimens, appear inadequate.

Treatment by excision practised by Rose, Huesner, and Margary, hardly recommends itself as justifiable, unless in painful or helpless cases, and even in these in double congenital dislocation it would seem of doubtful advantage.

The cases where the methods of forcible reduction under anæsthesia would be successful are certainly few. The method has been tried by Post, of Boston, and by Paci, who reports success in some instances, but such cases must be of the lightest variety.

The method, which at present is attracting especial attention, is that advocated by Hoffa, of Würzburg,—namely, operative reduction of the congenital dislocation.

Hoffa himself has operated in twenty-four cases, and claims satisfactory results in most cases. His final conclusions he promises to publish later. He operates by preference on young children.

Mollière [1] reports two successful cases.

Denucé, of Bordeaux, reports a case of a child of six operated on by him. The left trochanter major was three centimetres above the Nélaton line, and after operation the head of the trochanter was not above the Nélaton line. A year afterwards the patient was in good condition. There was no lordosis and little scoliosis. The difference in the length of the leg was about two centimetres, having been about five centimetres before.

Kirmisson,[2] in an excellent article on the subject, reports seven cases of the operation, with two deaths, and five satisfactory results. Of these five, three of the results are reported to be excellent.

Broca reported a death from this operation.

Lorenz, who has operated in a number of cases, mentions a case of septicæmia, and Kirmisson knows of a few fatal cases in the hands of other surgeons, which he is not authorized to mention.

Hoffa himself has had one death.

The method of operation is described by Hoffa in his work on "Orthopædic Surgery," page 532,—

"After opening the joint by means of a Langenbeck incision, and subperitoneal separation of all the soft parts from the trochanter major, it is possible, in young patients to the age of seven, to place the head of the femur, by a flexion of the thigh and direct pressure, into the normal acetabulum. Without separation of the soft parts, even after the joint is opened, it is impossible to effect a reduction, but after the reduction of the head with the knee and hip flexed, if

[1] Lyon Médical, 1887, No. 9.

[2] Revue d'Orthopédie, 1894, p. 186.

FIG. 1.—Anterior view of a specimen of double congenital dislocation of the hip, after removal of superficial soft parts. A, femur not operated upon; B, operated upon, with improvement in position, but still not in normal position.

an attempt is made to straighten the knee, the head of the femur slips out of the acetabulum. It is, therefore, important that the head should be kept fast in the acetabulum, while an assistant gradually stretches the biceps, the semi-membranosus and the semi-tendinosus."

Hoffa also advises the subcutaneous division of the fascia lata, and the muscles which pass from the spine of the ilium. The second step of Hoffa's operation is the making of a new acetabulum. This is done by means of a Volkmann's curette, made in the shape of a bayonet, which, under the guidance of the forefinger, chisels out the whole of the acetabulum. Care should be given that the borders of the acetabulum remain strong. Hoffa claims that in a normal infant child's pelvis the ilium is thickest at the point where the acetabulum should be made deeper in a congenital dislocation. The third step of the operation consists of the reposition, which is recognized by the characteristic sudden motion of the head of the femur, as in reduction after traumatic luxation.

Hoffa claims that the obstacle to reduction is the shortening of the soft parts which surround the dislocated hip. This view is disputed by Karewski, who thinks that the altered shape of the bone interferes with the reduction, and by Lorenz, who thinks that the shortened adductors also prevent reduction.

The obstacles to reduction and the difficulties to be met in operation are well illustrated by a specimen represented in the accompanying illustration. (Fig. 1.)

The specimen is from a child nine years of age, somewhat older than is most suitable for the operation, who died from diphtheria and septicæmia a month after Hoffa's operation. The wound had nearly united a week after the operation, the child's temperature, however, was elevated, and a diphtheritic membrane appeared in the throat; the wound afterwards became septic, and at the autopsy evidences of extensive diphtheria and of septicæmia were found. An abscess near the hip had formed, passing from the inner side of the pelvis running upward in the sheath of the iliac muscle.

During the operation, which was conducted with the usual care, according to the steps mentioned by Hoffa, it was impossible to draw the head down as far as the Nélaton line. The finger was inserted, and a point found where the acetabulum should be as far as could be determined by touch, and this was curetted and drilled out, forming, as was thought, an acetabulum of sufficient depth. It was impossible by any form of traction to bring the trochanter lower than was done.

Although all the muscles had been divided and removed, it was impossible to pull the femur into its normal position. Reduction was possible by manipulation,—*i.e.*, flexion and rotation; but dislocation occurred if an attempt was made to straighten the femur from the flexed position which it takes if the head is put into the acetabulum. The specimen shows that the obstacle is clearly the anterior and strongest fibres of the capsular ligament. On the side not operated upon, it is impossible to reduce the dislocation by any method, either by traction or manipulation. The specimen also shows that although the curette was used at a point which at operation appeared to be the proper position, yet it did not enlarge the normal acetabulum, but was at a considerable distance above this place. (Fig. 2.)

It would also appear that Kirmisson is correct in claiming that facts do not support Hoffa's belief that the portion of the ilium in congenital dislocation, that it is desirable to curette for the deepened acetabulum, is the thickest portion of the ilium. This was not found to be the case in any of the four specimens at the Warren Museum in Boston.

The clinical experience which the writer has had personally in the treatment of this deformity may be stated briefly as follows:

One case. Aged six. Treatment by mechanical means,—viz., the use of an ambulatory traction appliance which was worn for two years, showed no change in the deformity.

One case. Aged three. Treatment by an attempt at forcible reduction under ether without success.

Three cases. Treatment by recumbency and traction for a long period.

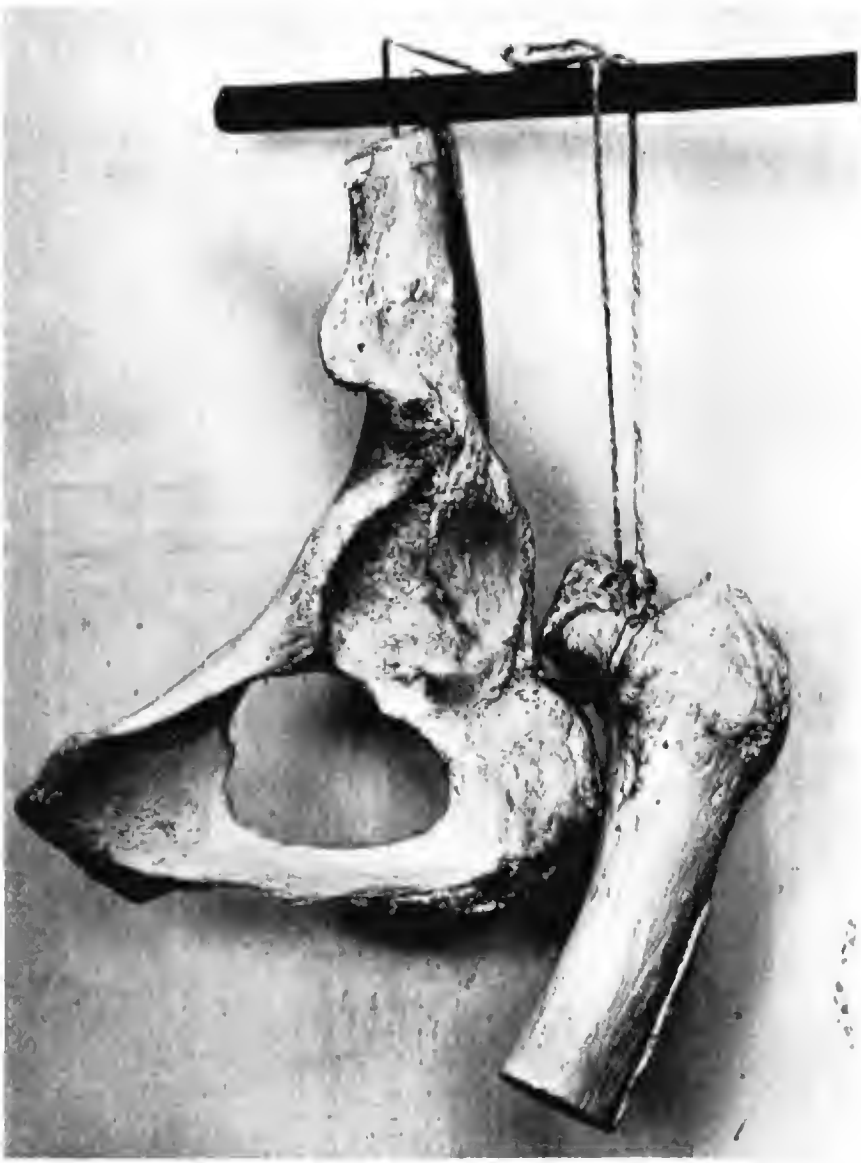

FIG. 2.—View of innominate bone and head of femur from a case of congenital dislocation of the hip, after operation for formation of new acetabulum and reduction of the dislocation.

CASE I.—Aged five. Treatment by recumbency for a year with traction. Afterwards by traction appliances and crutches for two years, and subsequently by a corset pressing upon the trochanters. An increase in the deformity occurred in this case. The patient at present walks badly. The deformity was double.

CASE II, a child eight years of age, was treated for six months by recumbency and traction. Afterwards for four years by a leather corset (stiffened with steel) pressing upon the trochanters. The patient's figure has improved. No increase in the deformity occurred in the five years during which she was under observation, and at the present time the patient walks quite well with but little waddling in gait. The deformity was double and the patient strong. The patient is at present sixteen years of age.

CASE III (double) was treated for three years by recumbency, the treatment beginning when the child was three years of age. The case is reported[1] elsewhere with details of apparatus. Subsequent treatment was by ischiatic crutches, which were worn for two years, and at present a leather corset pressing upon the trochanters is worn. There has been a reduction in the deformity, the trochanters standing lower than before treatment was begun. The patient walks well and the trochanters remain fixed and cannot be pushed up or down, but they remain an inch higher than the Nélaton line, though formerly an inch and a half.

Five operations according to Hoffa's method:

A. F., three years old. Double deformity. Two operations.
A. W., three years old. Single deformity. One operation.
M. C., three years old. Single deformity. One operation.
M. Col., three years old. Double deformity. Two operations.
H. K., Eight years old. Double deformity. One operation.

The results in these cases can hardly be considered satisfactory. In all except the last the wound healed up thoroughly and well. In the last, the wound, a week after operation, was progressing favorably, but the child was seized with diphtheria and died three weeks later with diphtheria and sepsis of the wound, being the case the specimen from which is presented in this paper.

In the case of M. Col., the first operation healed readily, but a week after the second operation the patient was taken with scarlet fever and died.

[1] Transactions of the American Orthopædic Association, Vol. IV, p. 308.

In the case of A. W., the wound healed, but the child died with symptoms of diarrhœa and vomiting, a month after operation, apparently without any connection with the operation, the wound having entirely healed.

In the surviving cases, A. F. and M. C., the patients recovered well from the operations (double in the first and single in the second case). It did not appear, however, that the head of the femur was well fixed in the new acetabulum in either of the cases, or that the patient had been materially benefited by the operation.

The three deaths can hardly be attributed fairly to the operation, the first two occurring at a time when the hospital was visited by an epidemic of contagious disease. It is probable, however, that the operation may have diminished the patient's power of resistance, in both these cases as in the third case.

The obstacles which the writer has met in Hoffa's operation are: first, the difficulty of exactly determining the location of the true acetabulum; second, the difficulty of complete reduction; and third, the difficulty in retention of the head when thoroughly reduced. The first of these difficulties can, in a measure, be met by an increased experience with the operation. The second of these obstacles is overcome by Hoffa, not only by the severance of the muscles from the head of the trochanter, but also by a complete freeing of the capsule from the neck of the femur. This is accomplished after opening the capsule from behind and thrusting the femur upward through the wound and freeing the capsule from behind forward.

Hoffa finds his best success in younger children, and is unable to effect a reduction in children of advanced age in adolescence.

Lorenz advocates an anterior incision.

In view of the evidence given in the pathological specimens here reported, it seems clear to the writer that the chief obstacle to the reduction lies in the ilio-femoral bands of the capsular ligament (the so-called Y ligament of Bigelow), and that for a thorough division of these fibres it is better to open the capsule from the front—than from behind—as the strongest bands are on the anterior surface.

Through the courtesy of Professor Dwight, and with the assistance of Dr. Prescott, a number of dissections of the hip-joint were examined, which displayed the attachments of the capsular ligaments of the hip, seen in their anterior and posterior aspects. Operative procedures were tried upon cadavera and the following lines of incision were found to be of advantage: A long incision is made on the outer side of the thigh, reaching from one inch above the trochanter to two inches below. The incision penetrated to the head of the femur, the neck, and along the outer border of the trochanter. The incision is slightly in front of the external border of the trochanter. The soft parts are retracted, and the attachment of the muscles to the head of the great trochanter separated, the anterior aspect of the neck of the femur and the adjacent trochanter freed, and the soft tissues retracted so as to lay bare the neck of the femur on its anterior aspect, and an incision at right angles with the axis of the neck freely made, thoroughly dividing the attachments of the Y ligament near the intertrochanteric line of the femur. After this is divided, it will be found that after the cotyloid ligament is incised the head of the femur can readily be pulled down an inch; in congenital dislocation, where the cotyloid ligament is not present, no difficulty will be met in placing the head where it is desired after division of the contracted soft parts. The operation would, therefore, consist in making, under aseptic precautions, a compound dislocation of the head of the femur, removing it from its abnormal socket and placing it in the normal socket, dividing all tissues which prevent reduction.

The incision here mentioned would seem to have the advantage over the method described by Hoffa in dividing more directly the most resistant checks to reduction. It is probable that, in the successful cases which Hoffa reports, the attachments of the capsular ligament have been thoroughly freed, but it would seem to the writer that this would be accomplished with certainty in the incision recommended only by a surgeon of Professor Hoffa's skill and experience in the operation.

It has occurred also to the writer that, in all probability, if an anterior division of the strong ilio-femoral capsular bands were to

be made freely, older cases would be operated upon with better success than those of the age recommended by Hoffa, for no direct obstacle exists to reduction even in adolescent cases except the contraction of the soft parts.

The incision which seems to the writer most suitable may be briefly described as a primary side incision along the trochanter (in front of the line of the Langenbeck incision) and a secondary deeper cross-cut on the anterior surface of the capsule near the intertrochanter line of the femur.

Instead of this incision, the Lorenz incision, *i. e.*, an anterior incision directly over the neck and exposing at once the anterior face of the capsule, naturally suggests itself. This has its advantage, but the attachments of the muscles to the greater trochanter are not so readily freed as by the side incision, and drainage is not so well provided for, which in a deep wound is of importance.

Since the experiments were made upon cadaver, the writer has had an opportunity of performing the operation on a living subject, a child four years of age, with a congenital dislocation of the hip on the right side, the result confirming the conclusions reached by anatomical investigations. The operation was done in the manner just mentioned, and reduction was made readily, the head of the femur slipping without difficulty into the acetabulum. It was found, after the attachment of the muscles to the trochanter had been divided, that on flexion of the limb, reduction by manipulation was readily made, but on attempting to straighten the limb, the head of the femur slipped instantly from the normal acetabulum. After, however, the anterior bands of the capsular ligament were freely divided, the head remained in its socket without difficulty in whatever position the limb was placed, without the use of traction. Some contraction of the adductor muscles was found on extreme abduction of the leg. The most resistant fibres of the adductor magnus were divided by open incision. The patient has recovered from the operation, the wound has healed, but, as only six weeks have elapsed since operation, the ultimate result cannot be reported as yet. The case can, however, stand as evidence of the readier method of successful reduction.

The writer has found difficulty in retaining the head of the femur in the acetabulum into which the head is reduced after an operation. It has appeared to the writer that this difficulty is perhaps due to the fact of imperfect reduction, but especially to imperfect lengthening of the string, the shortened tissues on the anterior surface of the capsule. If these ligamentous bands are short, dislocation is easy, whatever the depth of the acetabulum may be. It would appear, from the specimens examined, that the curette is not necessary in young children, as an acetabulum appears to be present.

The conclusions which the writer has formed from such experience upon the subject of congenital dislocation as has come to his knowledge are briefly as follows: (1) That the methods of treatment by traction, or by mechanical means, crutches, splints, recumbent traction, with or without tenotomy, do not effect a cure; (2) correction by means of forcible reduction without incision can be applicable in but few cases, and is not reliable; (3) that the method of operative reduction offers the best prospect of a cure. The method at present, however, involves risks, and is not certain in its results, but it is to be expected that further experience will give greater precision and more certain results, as no inherent difficulties lie in the way of operation; that the condition of the shortening of the muscles, the shortened condition of the anterior bands of the capsular ligament (described by Bigelow as the Y ligament), forms an important obstacle to complete reduction, and that these fibres should be thoroughly divided. It is also the opinion of the writer that these fibres can be more thoroughly divided by incising them from in front than from behind.